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A SKETCH OF THE HISTORY OF PSYCHOLOGY AMONG THE GREEKS.

BY CHARLES A. STRONG.

The following paper is an abstract of six lectures delivered at Clark University in the autumn of 1890 on the history of psychology among the Greeks from the earliest times down to Aristotle.[1] The psychologists of this period are the philosophers, and their psychological doctrines are for the most part so intimately bound up with their philosophy that a sketch of the former necessarily involves some mention of the latter. We must therefore devote a few words to the metaphysics of each philosopher before taking up his psychology. But the psychological theories of the Greek philosophers stand in the closest relation to the animistic beliefs that prevailed among the early Greeks; and our sketch would be unintelligible without a preliminary account of these.

I.

Long before scientific psychology begins, there exists an ancient popular psychology, which embodies the earliest naïve notions of uncivilized men about the soul and its activities. These notions are found among barbarous and semi-

[1] The chief authorities on the psychology of the Greeks are the great work of Zeller, Die Philosophie der Griechen, of which I have used the last edition; and Prof. Siebeck's Geschichte der Psychologie, Gotha, 1880-84, which is completed as far as Thomas Aquinas. On the animistic conceptions of the Homeric Greeks, see Erwin Rohde, Psyche: Seelencult und Unsterblichkeitsglaube der Griechen, Freiburg i. B., 1890, pp. 1–11. On the relation between Greek psychology and animism, see Julius Lippert, Die Religionen der europäischen Kulturvölker, Berlin, 1881, Einleitung and pp. 250–275.

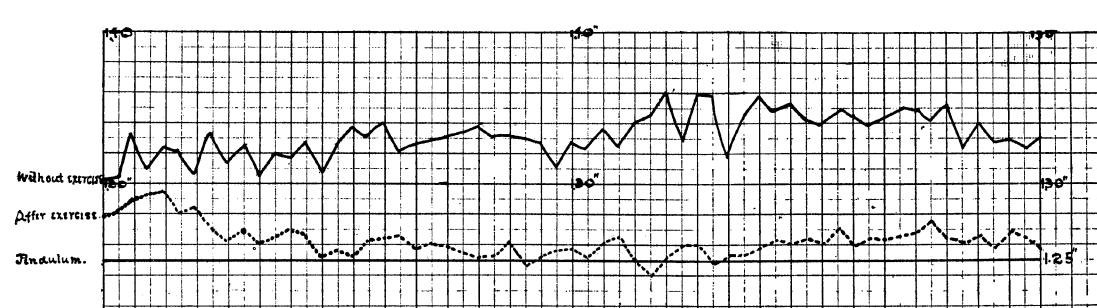


Fig. I.

Interval 1.25"
General Average of 12 persons, 60 tests
Without exercise ..... 1.8228"
After 3 min. do. on .25" interval 1.2533"
Average difference .0695"

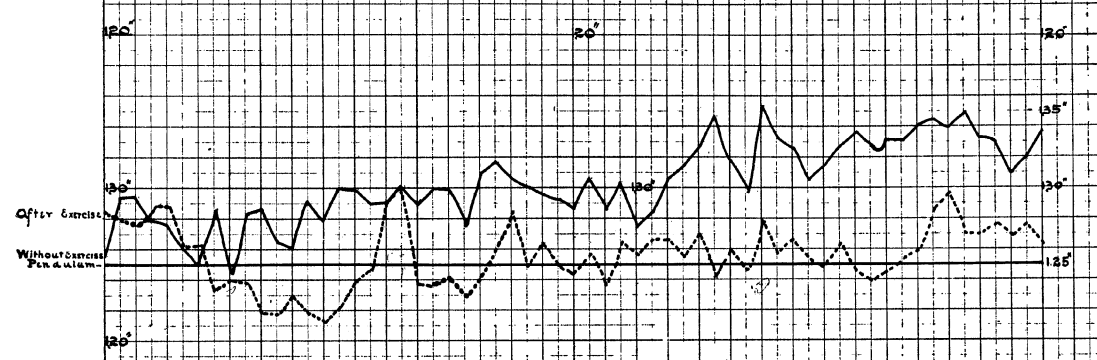
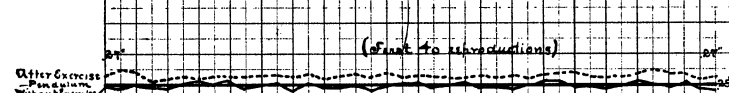


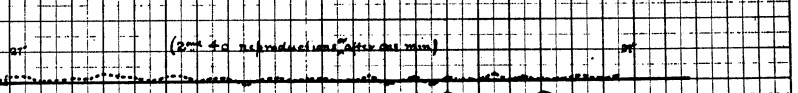
Fig. II.

Interval 1.25"
(Dr. K.) Average of one person, 9 tests.
Without exercise ..... 1.3069"
After 3 min. do. on .25" interval 1.2535"
Average difference .0534"

Fig. III.

Interval .25"
Average of 8 persons, 30 tests.

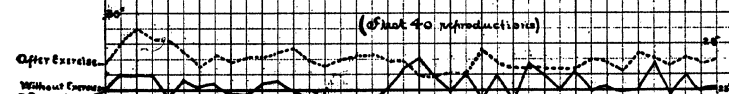


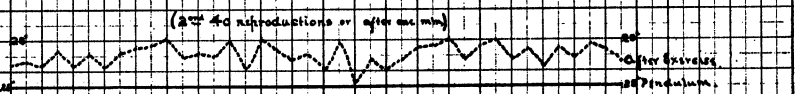


Total Without exercise .2546"
After do. (5 min. on 1.25") .2448"
Difference .0098"

Fig. IV.

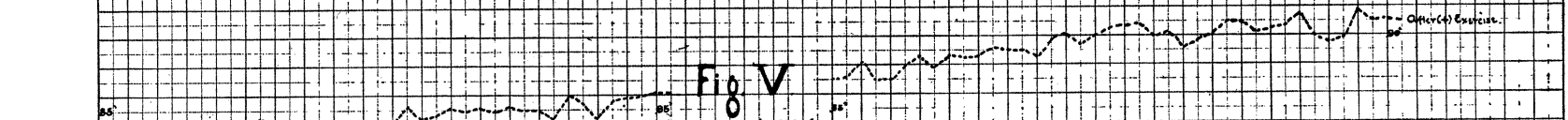
(Dr. K.) 8 tests
Interval .25"

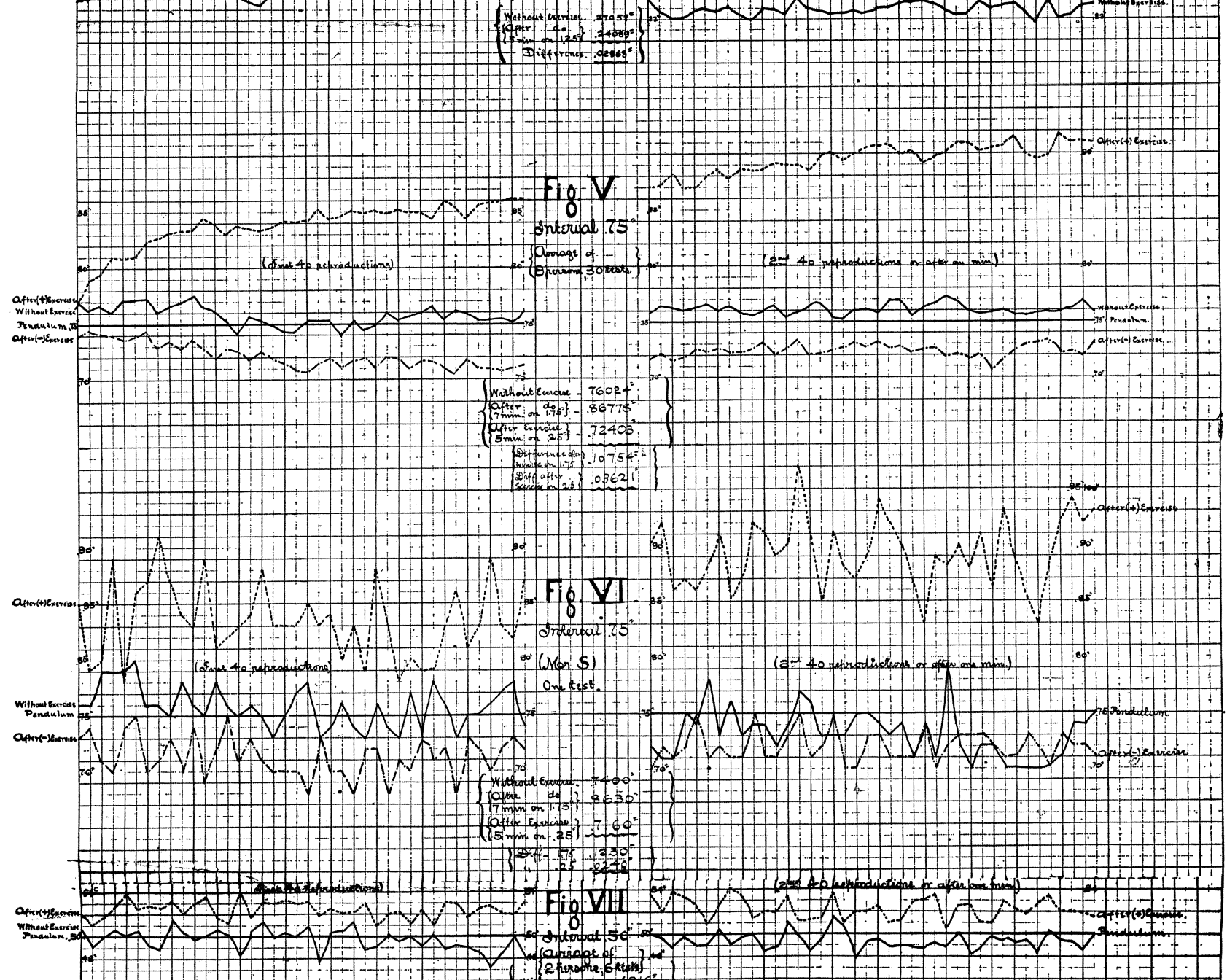


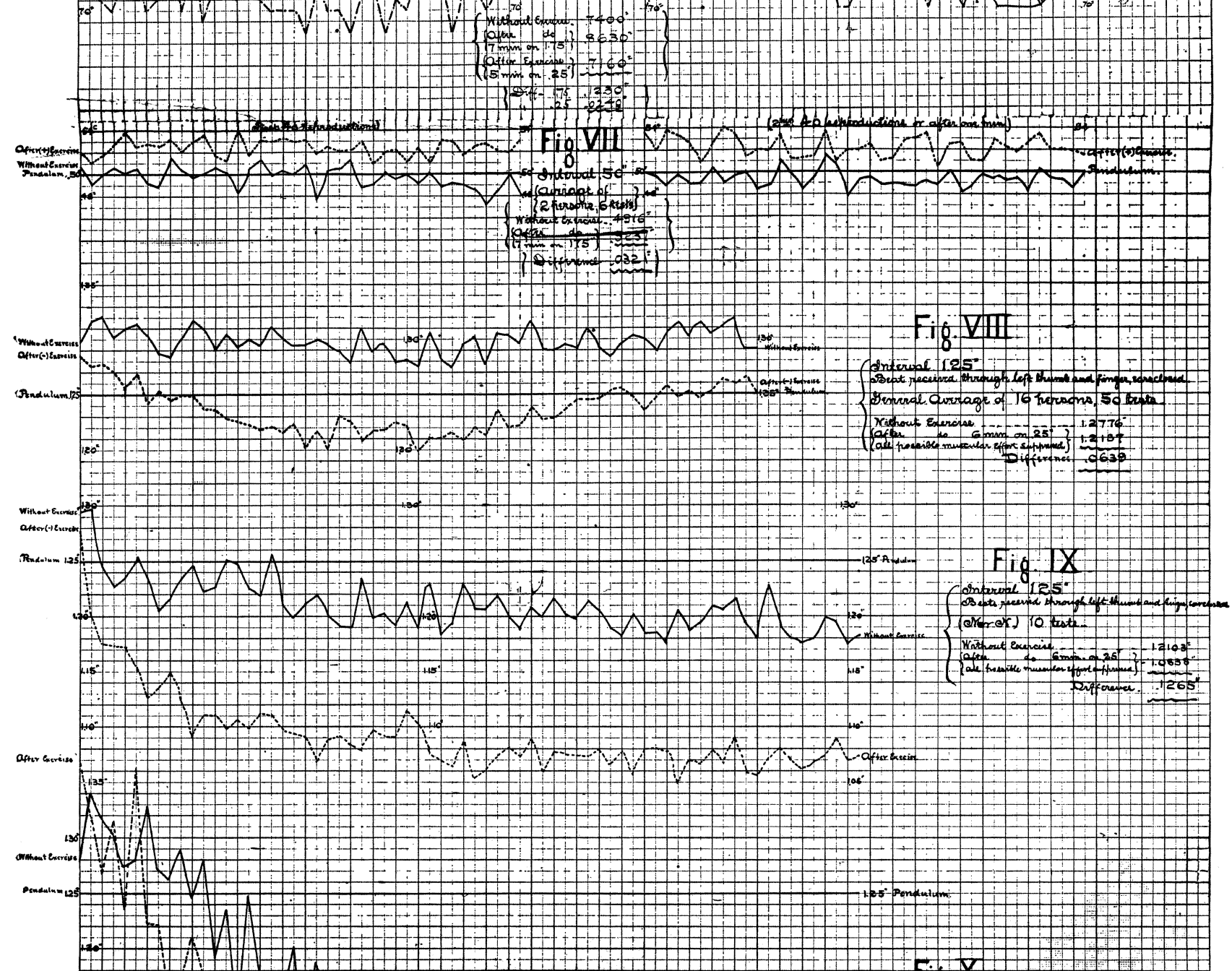


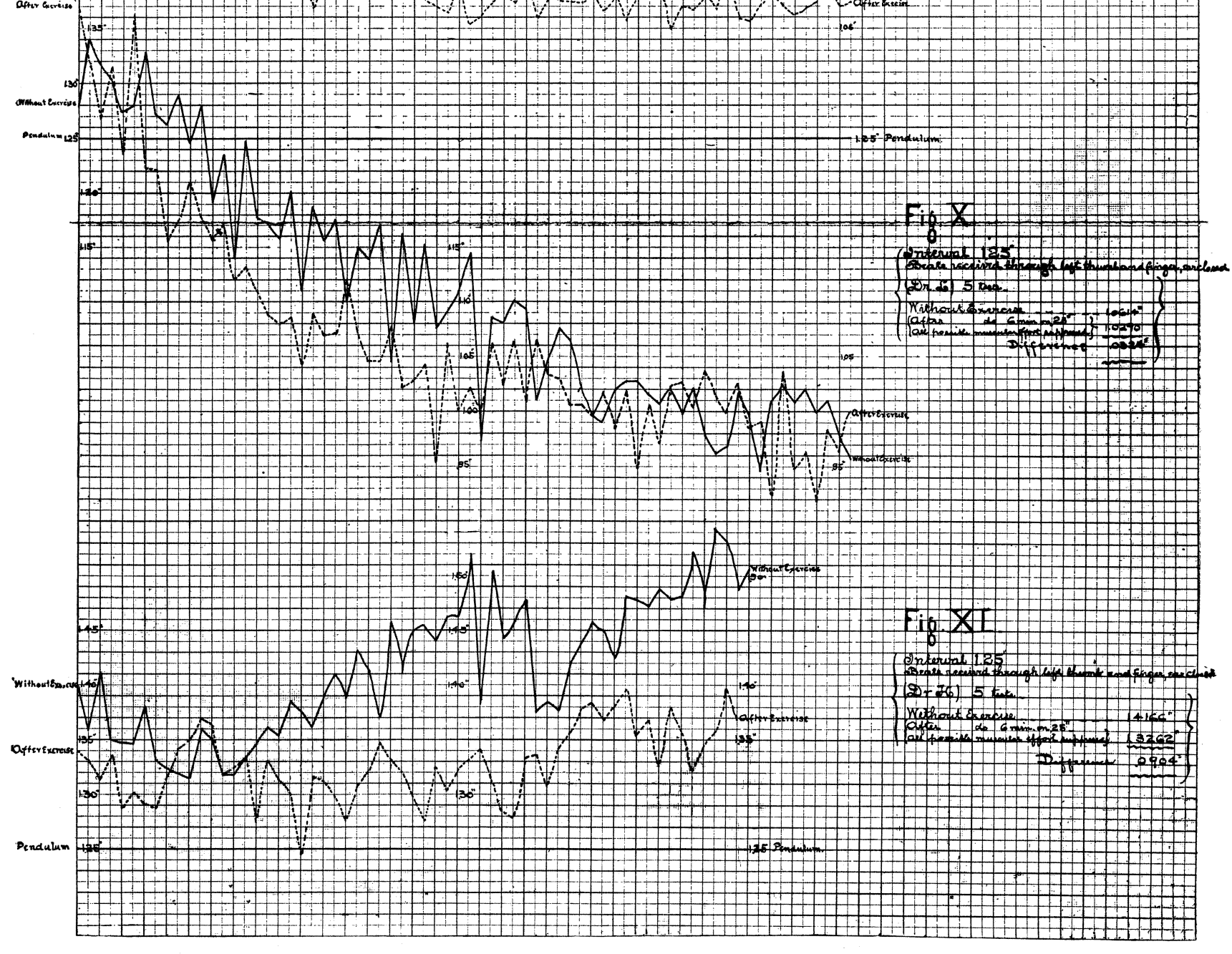
Without exercise .2745"
After do. (5 min. on 1.25") .2408"
Difference .0286"

Fig V




Without Exercise .27452"
After do .24089"
Difference .02965"
After(+) Exercise.
Fig V
Interval .75"
(Average of 6 persons 30 tests)
(First 40 reproductions)
(2nd 40 reproductions or after one min.)
After(+) Exercise
Without Exercise
Pendulum .75"
After(-) Exercise
Without Exercise .76024"
After do (7 min. on .75") .86778"
After Exercise (5 min. on .25") .72403"
Difference after .75 .10754"
Diff. after .25 .03621
Fig VI
Interval .75"
(Mor S)
One test.
(First 40 reproductions)
(2nd 40 reproductions or after one min.)
Without Exercise
Pendulum
After(-) Exercise
Without Exercise .7400"
After do (7 min. on .75") .8630"
After Exercise (5 min. on .25") .7160"
Diff. .75 .1230"
.25 .0240"
Fig VII
Interval .5"
(Average of 2 persons 6 tests)
(First 40 reproductions)
(2nd 40 reproductions or after one min.)
After(+) Exercise
Without Exercise
Pendulum .50"
After(-) Exercise
Pendulum.


Without Exercise .7400"
After do 7 mm on .75" .8630"
After Exercise 5 mm on .25" .7160"
Diff. .75 .1230"
Diff. .25 .0216"
Fig VIII
Interval .5c"
Average of (2 persons, 6 tests)
Without Exercise .4916"
After do (7 mm on .75") .5231"
Difference .0321"
(2nd set 40 reproductions or after one hour)
After (+) Exercise
Pendulum
Fig. VIII
Interval 125"
Beats received through left thumb and finger correlated.
General Average of 16 persons, 50 tests
Without Exercise 1.2776"
After do 6 mm on .25" 1.2187"
(all possible muscular effort suppressed)
Difference .0639"
Fig. IX
Interval 125"
Beats received through left thumb and finger correlated.
(Mr. C.) 10 tests.
Without Exercise 1.2103"
After do 6 mm on .25" 1.0838"
(all possible muscular effort suppressed)
Difference .1265"
Without Exercise
After (-) Exercise
Pendulum 1.25"
After Exercise
Pendulum


After Exercise
135"
130"
Without Exercise
Pendulum
125"
120"
115"
110"
105"
100"
95"
85"
125" Pendulum.
Fig. X
Interval 125"
Breaks received through left thumb and finger, enclosed
(Dr. do) 5 Dec.
Without Exercise 1.0515"
After do 6 min. m. 28" 1.0290
(all possible muscular effort supposed)
Difference .0225"
After Exercise
Without Exercise
Without Exercise
Dec.
After Exercise
Without Exercise
Pendulum
125" Pendulum.
Fig. XI
Interval 125"
Breaks received through left thumb and finger, enclosed
(Dr 76) 5 Dec.
Without Exercise 1.4166"
After do 6 min. m. 28" 1.3262"
(all possible muscular effort supposed)
Difference .0904"

barbarous tribes in all parts of the world. Their universal diffusion is better authenticated than that of religion itself. Linguistic research proves that they were entertained by our Aryan ancestors; and the Homeric poems furnish the amplest evidence that they were shared by the early Greeks.

The animistic notion of the soul, according to Tylor,[1] is that of a "thin, unsubstantial human image, in its nature a sort of vapor, film, or shadow; the cause of life and thought in the individual it animates; . . . capable of leaving the body far behind, to flash swiftly from place to place; mostly impalpable and invisible, yet appearing to men waking or asleep as a phantasm . . . . ; continuing to exist and to appear to men after the death of the body . . . . . " The soul is thus that whose indwelling in a man causes him to be alive, and whose departure causes him to die. Its existence is assumed in the first instance for the purpose of explaining the difference between life and death. The movement and activity of living beings must, it is felt, be due to some interior cause, and this cause is called the soul. The abrupt transition from life to the stillness of death is explained as due to the departure of the soul.

That this is the true origin of the notion of the soul, we have evidence in certain further beliefs that are well-nigh universal among uncivilized peoples. In the first place, the soul is represented as analogous to, if not identical with, the breath: hence the Hebrew words *nephesh*, *ruach*; the Greek *psyche*, from *psychein* to freshen with the breath, and *pneuma*, from *pnein* to blow; the Latin *anima*, *animus*, connected with the Greek *anemos*, wind, and *spiritus*, from *spirare* to breathe. Now the commonest observations of the difference between life and death would naturally lead men to connect the soul both with the breath and with the blood. For, in the first place, loss of blood means loss of vital force, and if too much blood be lost death is the consequence. In the second place, men breathe as long as they are alive, and cease to breathe when they die. Furthermore, the savage has no clear conception of the function of the lungs, but supposes that in some way the inspired air gets into the blood and is carried by it all over the body. It is thus a pretty consistent theory which identifies the soul with the breath, and finds its special seat in the blood.

Such, then, were the conceptions of the Homeric Greeks regarding the soul and its relations to the body. In what sense they conceive the soul to be the cause of life and movement appears from their views of its condition after death.

[1] Primitive Culture, I., p. 429.

When death overtakes a Homeric warrior, his soul escapes through his mouth, or through a gaping wound, and hurries to the house of Hades. When separated from the body it is called *eidolon* or image. These images are thin and unsubstantial as smoke or shadow; being "as the air invulnerable," they elude the grasp of the living. Their life in the lower world is a pale, disconsolate one; indeed, they can hardly be said to live at all, for they no longer possess consciousness and volition; the truth is that "they do not live, but only exist." There is, however, one means by which they can temporarily recover life and consciousness, and that is by partaking of blood. The soul cannot therefore, in the conception of the Homeric Greeks, be said to be the independent possessor of life and consciousness. Only so long as the soul remains connected with the body — only so long as the soul retains its union with the blood — does mental activity continue. It follows that sensation, thought, and volition are functions of the living being which soul and body constitute, not of the soul alone.

While the blood in general is conceived to be the seat of the soul, the mental faculties are assigned a special seat in the breast. Thus the word for midriff or diaphragm is the common expression for mind; for the main reservoir of the blood is in the breast, and the midriff is put by metonymy for this entire region. Similarly, the various words for heart are used to denote the subject of the states of feeling. In general, the attention of the Homeric Greek is turned more especially towards the robuster states of feeling; which explains why the psychical activities, including even perception and thought, are supposed to have their seat in the breast, and not at all in the head or the brain.

II.

Down to the time of the Sophists, the Greek philosophers are mainly occupied with cosmological problems. When the Ionics declare that all things consist of water, air, or fire, they do not mean by water, air, and fire just what we mean by these words. The conception of matter as matter, that is, as lifeless, passive, inert substance, is a late scientific product. Nor must we imagine that the problem they are endeavoring to solve is a purely physical and not rather a biological one. They are not leaving living beings out of account, and seeking simply to explain the mutations of matter; on the contrary, they regard all matter as alive, and if they select water, or air, or fire, as their fundamental principle, it is because they think they see in this form of matter rather than in any other the essential basis of life.

The early Greeks, as we have seen, consider the soul to be closely connected with the breath, and to have its seat in the blood. Now there is a difference between living and dead blood; when the blood of a dying man flows out into the air, it grows cold, coagulates, and dries. Thus, at the same time that the soul disappears, the warmth and moisture of the blood disappear. It is furthermore a striking fact that the breath also is both warm and moist, and that it leaves a palpable residuum of warm moisture behind it. What more natural, then, than to take this warm moisture which is the common element in both blood and breath, and identify it with the soul?

This is what *Thales* does when he declares that the first principle of things is water. Water, he says, is the substance of which all things consist. In men and animals, it is the warm moisture of the blood upon which life and movement depend. Since this is so, the life and movement of external nature are to be accounted for by the same analogy; they must be due to the fact that all things are at bottom forms of water. Hence his statements that "the whole world is alive and full of gods," that is, of souls; and that even the magnet has a soul, since it is able to produce motion.

Aristotle conjectures that Thales may have been led to his theory by the observation that the food of all animals is moist, and that they all originate from moist seed. However this may be, we know that *Hippo*, a contemporary of Thales, who agreed with him in identifying the soul with water, or rather with moisture, strongly combatted the traditional view that the soul is in the blood, and maintained that it is in the seed. He seems to have supposed that the seed is not only the starting-point from which the new individual is developed, but remains in the body throughout life and forms the nucleus in which the vital activities centre. We thus have two opposite theories of psychogenesis — the one that the soul is in the blood, and is therefore derived from the mother; the other that it is in the seed, and therefore derived from the father.

Anaximenes regarded air as the stuff of which the soul consists, and held that all things are formed out of air by condensation and rarefaction. This theory is little more than a philosophical re-editing of the popular view that in breathing the soul is nourished by the inspired air, which, it is argued, must therefore be of the same nature as the soul.

Diogenes of Apollonia agrees with Anaximenes in identifying the soul with air. The centre of life and thought is the heart; here the blood is formed, and here it is mingled with air, which it carries to every part of the body. "The life

which pervades the entire body has its source in the blood, which is foamy and filled with air." He also points out that the seed is foamy and filled with air, "like the blood"; and does not forget to insist that in both cases an essential quality of this air is its warmth.

It is only an accentuation of this view when *Heraclitus*, the greatest of the Ionic philosophers, maintains that all things consist of fire. By fire he does not mean flame, but a dry warm vapor, which he conceives to be the essence of fire. Fire, in this sense, is the stuff of which the soul consists, and is present in the breath as its essential constituent. Heraclitus has by no means abandoned the popular notion which finds the principle of life in the blood and the breath; it is only a different constituent of these which strikes him as essential, namely the quality of warmth. On the one hand, he is deeply impressed with the phenomenon of animal heat; on the other, the observation of the subtle, penetrating, mobile, destructive character of fire outside the organism convinces him that this, of all other natural substances, is the principle of life and activity. All things consist of fire, but not all things manifest the familiar qualities of fire. For all things are in eternal flux; all things are continually changing their qualities. This happens because all things are continually undergoing either condensation or rarefaction. In their state of highest rarefaction they are what we call fire, and then it is that they manifest the qualities of soul; but the process of condensation now transforms them successively into air, water, and earth. The human organism is compounded out of the elements at the bottom and those at the top of the world-process, in such a way that the body consists of earth and the soul of fire. The mechanical bond which connects the individual soul with the diffused soul of the world is respiration; in respiration we breathe in the fire and therefore the rationality diffused in the air.

Empedocles conceives all natural objects to be mixtures of four original elements — fire, air, water, and earth — which he was perhaps the first thus to distinguish; and to be subject to the action of two forces, one attractive and the other repulsive, to which he gives the allegorical designations of love and hate. In the course of his physical theory he seems to have made no mention of the soul, and nowhere to have dropped a hint that he regards it as a being distinct from the body. But he mentions various psychical activities, and his explanation of them is a consequence of his philosophical theory. The faculty of thought, for example, he explains as consisting in a certain mixture of the substances that compose the blood, and he explains the other faculties in a similar manner.

We find an analogous view in the *Pythagorean school*, certain members of which held that the body consists of two pairs of opposites, the warm and the cold, the dry and the moist, and that the soul is the harmony or appropriate mixture of these. Besides this the Pythagoreans put forth two further views of the nature of the soul. The first is a deduction from their philosophy, whose fundamental thesis is that the essence of the world consists in numbers, or the mathematical properties of things; in conformity with this principle they define the soul as a number endowed with the power of self-movement. The other view is of a religious nature, and closely allied to the tradition propagated in the Orphic mysteries; it regards the soul as an immortal being, imprisoned in the body as a punishment for its sins, and calls the body the tomb of the soul. This view was subsequently taken up by Plato, and gives a characteristic coloring to his whole psychological theory.

III.

To understand the philosophical basis of the psychology of *Democritus*, we must go back to the Eleatics, whose fundamental principle is the exact opposite of that of Heraclitus. Heraclitus is so impressed with the fact of change that he makes it the principle of things; for his fire is simply the personification of restless change. Parmenides, on the other hand, thinks he sees clearly the impossibility of such a thing as change; that one thing should change into another different from itself seems to him to involve a contradiction. He therefore denies the reality of the sensible world, where such changes seem to occur, and affirms that the only reality is all-inclusive "Being," and that "Being" remains forever immutably what it is. The atoms of Democritus are simply the "Being" of Parmenides cut up very fine. Like it, they are ingenerable, indestructible, and immutable. They possess only mathematical qualities, and therefore differ from one another only in shape, order, and position. They are infinite in number, and together constitute the universe, and there is nothing beside them.

Though the soul is distinct from the body, it is impossible on atomistic principles that it should be other than corporeal. But the matter of which it consists must be of a sort to explain its essential properties, which are, first, motion, and secondly, thought. Now motion can only proceed from that which is itself in motion, and the soul must therefore consist of the most mobile kind of atoms; these are the very fine, smooth, round ones that constitute fire. Democritus thus agrees

with Heraclitus that the soul is of the nature of fire. This harmonizes well with the second essential property of the soul, thought; for thought is itself a subtle kind of motion. The fiery atoms that constitute soul are diffused through the entire body, in such a way that between every two body-atoms there is a soul-atom. The body is alive in all its parts, because in all parts there are atoms which by virtue of their nature are in continual motion, and which therefore set in motion the atoms that surround them. But the motion of the soul-atoms is not the same in every part of the body; that is to say, the different psychical activities have their seat in different parts, thought in the brain, anger in the heart, desire in the liver. Since the fiery atoms that constitute soul are everywhere diffused in space, the whole world must be alive; yet not in the sense of a unitary being. "There must be much soul diffused in the air, how otherwise could we breathe in life and soul out of it?" The preservation of life depends upon the uninterrupted accession of new soul-atoms from without in breathing. For since the soul is not completely enclosed by the body, some of its atoms are continually escaping; the surrounding air presses them out of the body because of their smallness and fineness. Breathing not only introduces new soul-atoms into the body, to replace those that are lost, but mechanically obstructs the exit of those that remain. When breathing ceases, the last obstacle to the escape of the soul-atoms is removed, and their departure is what we call death.

The fact that this theory is materialistic does not prevent it from being an almost perfect reproduction of primitive animism; for animism itself is vaguely materialistic. The theory of atoms is the only novel feature. We may point to the following elements as distinctly animistic: the view that the soul is not immaterial, but only a more ethereal kind of matter than the body; the view that in breathing the soul receives nourishment from without; the view that the soul lives in the body while breathing continues, and disappears with the breath; the view that the soul is identical with the bodily warmth.

In the theories we have thus far considered, the common tendency has been to regard the soul as a refined form of matter. We cannot say that *Anaxagoras* gets wholly beyond this view, for he says that mind is unlimited, that it is the finest and purest of all things, and that in different objects there are greater or smaller portions of it. Nevertheless, if he still conceives mind as a form of matter, he manifests a clear insight into the radical difference that separates this form of matter from every other form. It is interesting to observe

the characters by which he seeks to differentiate mind-stuff from ordinary matter. Ordinary matter is a mixture of all things, containing particles of flesh, blood, vegetable tissue, gold, silver, etc., indiscriminately mingled together. In fact, every object contains particles of all existing substances, and receives its name as this or that only from those that predominate. "All things are together, everything is in everything else." In contrast to the indiscriminate mixedness and mutual dependence of ordinary matter, there must have existed from the beginning a special kind whose privilege it was to be absolutely independent and unmixed; for only that which is unmixed can have power over and know that which is mixed. This is what Anaxagoras calls *nous* or mind. Since mind has no constituents, it can have no qualities or differences within itself, but must be homogeneous throughout; while ordinary material things differ from one another according to their composition. Only by having no qualities can it *move* other things; for if it had qualities, it would be one among things, and they would then act upon it, and its dominion over them would not be absolute. Only by having no qualities can it *know* other things; for if it had qualities itself, these would dim its vision and prevent it from perceiving clearly the qualities of things. Mind is thus altogether active in its nature, and alone able to act without being acted upon. When it acts upon matter, it causes motion; in fact, mind is the original source of all motion. We might suppose motion to be uncaused and to be equally original with matter, were it not for the order and beauty which pervade the world, and which come about by means of motion; but these show that motion must have proceeded from some spiritual source, that is, from mind. Mind is thus the ruling element in the world, it "knows all things and has the greatest power."

It will be evident that the psychology of Anaxagoras marks the widest departure from animism we have yet encountered.

IV.

It does not enter into the plan of this sketch to present in detail the views of the pre-Socratic philosophers regarding the physiology and psychology of the senses; but we may insert at this point an account of the most ingenious and suggestive of these theories, that of Democritus, which will serve as a specimen of their general character.

In order that sensations may take place, it is necessary, according to Democritus, that portions of the external object should come in contact with the sense-organs, and that the impression there produced should be propagated into the in-

terior of the body and communicated to the atoms of soul. The impression on the sense-organ must have a certain intensity, that is to say, the parts that touch the sense-organ must have a certain density and solidity, otherwise no sensation arises; tones, for example, find access to the soul through every part of the body, but are heard only through the ears, because it is only through these that they find access in sufficient quantity. Democritus regards the sense-organs as merely passage-ways for matter; thus the essential feature of the eye is its moist and spongy character, and the ear is only a tube which admits the vibrating air into the body.

Visible objects give off effluences, which are images or copies of themselves in miniature, as it were their peeled-off surfaces. These images are complexes of atoms, like the objects from which they come. The essential thing in vision is, first, that these images should be reflected in the eye, and secondly, that the impressions thus produced should be propagated as far as the atoms of soul. Strictly speaking, it is not the images that leave visible objects that are reflected in the eye; for the space between objects and our eyes is filled with air, and the air is densified by the warmth of the sun, and this obstructs the passage of the images themselves; so that what actually reaches the eye and is reflected there is the likeness of the images impressed upon the densified air. This is why we see indistinctly at a distance; if the space between objects and our eyes were empty, we should be able to see an ant in the sky. A second hindrance to vision is the fact that effluences are continually given off by our eyes. It follows that we do not perceive things just as they are, but that the qualities of visible objects are partly subjective. Color is a purely subjective phenomenon, the objective cause of which lies in the mathematical qualities of things, which are the only qualities they possess in themselves. Here we have the earliest statement of the distinction between the primary and secondary qualities of matter. There are four fundamental colors — white, black, red, and green — all others are mixtures of these.

Passing to the sense of hearing, a sound or a tone is defined as a stream of atoms proceeding from a sonorous body. This stream sets in motion the air that lies before it, and thus produces a current consisting partly of atoms from the sonorous body, partly of atoms of air. In this current the atoms that have the same size, smoothness, roundness, and fineness drift together. The stream enters the body through the external passage of the ear and penetrates as far as the atoms of soul; when it acts upon these, auditory sen-

sations arise. A tone is purer in proportion to the homogeneousness of the atoms that compose the stream, higher in pitch in proportion to their smallness and fineness.

When certain of the effluences of things are inhaled into the nostrils, we have sensations of smell. A sweet taste is due to large, round atoms, which penetrate through the entire organism and affect it everywhere mildly and pleasantly. A sour taste is caused by rough, angular atoms; the taste of fat by small, thin, round ones. The atoms of a white object are "like the inner surface of a shell," that is, they are well-rounded, and they cast no shadows; those of a black object, on the contrary, are rough and uneven, and cast shadows. Objects that are smooth to the touch have their atoms regularly arranged; rough objects have their atoms irregularly arranged. The subjective qualities that objects present are due not only to the character of their atoms, but also to the quickness or slowness with which the effluences move, and the momentary density of the air through which they move.

Before passing to the psychology of Plato and Aristotle, we may devote a few words to the epistemological views of the pre-Socratic philosophers, which throw an instructive light upon their psychological method.

Heraclitus, Empedocles, and Democritus agree in subscribing to the theorem that like is known by like. Heraclitus states generally that we know the external fire by means of the fire within us. Empedocles goes further, and holds that our bodies contain water, earth and air as well as fire, and that we know air by means of the air in us, water by means of the water, and earth by means of the earth; in short, his assumption is that, if the external world is to be known, its constituents must also be those of the knowing subject. This theory may have found confirmation to his mind in the observation that the individual senses resemble the objects they are fitted to perceive: thus the eye not only perceives shining objects but shines itself, the air in the hollow of the ear resembles the external air, the skin is solid and resisting like the objects it touches, etc. Empedocles further states that the blood is adapted to be the substratum of thought because it contains all the elements mixed together, and that this is especially true of the blood in the neighborhood of the heart. Democritus adopts the same view when he says that we perceive everything with that part of our nature which is allied to it, and that the closer the resemblance between the two the more exact the sensation. He draws from this view a couple of sagacious inferences: that there are probably many things which we do not perceive because they are not suited to our senses; and that other beings may have senses which we do not possess.

Anaxagoras, on the other hand, is obliged, in consistency with his fundamental principle, to break with the theory that like is known by like; for mind is altogether unlike the material things it knows. Now one thing acts upon another by changing it into its own likeness; like therefore makes no impression upon like, for it produces no change in it; only unlike can act upon unlike in such a way as to alter it. Knowledge therefore depends upon the percipient subject being unlike the perceived object. Anaxagoras thus appears to recognize that sensation is a qualitative change of the subject, which cannot be produced by that which resembles the latter. He has not far to seek for observations to bear out this view; for instance, temperature sensations depend upon the skin being either warmer or colder than the object. He applies the same analogy to vision: vision, he says, consists in a reflection of the object in the eye-ball, but the background upon which it is reflected must be of a different color from the object, and this is why we cannot see in the dark, for all objects are then of the same color as the interior of the eye. Unlike, then, is always perceived by unlike. Since everything is in everything else, our bodies must contain particles of all possible substances; and this enables us to perceive every quality of external objects by means of its opposite in us — the rough by means of the smooth, the bitter by means of the sweet, etc.

Parmenides, Heraclitus, Empedocles, and Democritus all distinguish expressly between perception and thought, and give the preference to thought as the only trustworthy source of knowledge. Parmenides does so because the senses make it appear as if there were such a thing as change; Heraclitus, because they make it appear as if there were such a thing as permanence. Even Democritus, in spite of the consistent materialism of his theory, is obliged to recognize the superiority of thought; for the atoms of which all things are ultimately composed are imperceptible to sense, and must therefore be known by means of some higher faculty. Yet he says that the difference between perception and thought is only one of degree, the knowledge of the intellect being merely more acute than that of the senses; for both consist solely in material changes, and are produced in the same manner, by means of mechanical impressions from without. Indeed, it is difficult to see from the account he gives how perception and thought are differentiated from each other. Yet Democritus thinks very differently of their worth; sensible knowledge, he says, is "dark," the only genuine knowledge is that of the intellect.

V.

The distinctive position of *the Sophists* is that of scepticism in regard to the possibility of objective knowledge. Democritus had observed that colors, sounds, etc., are affections of the subject, not qualities belonging to material things in themselves. The Sophists generalize this observation, and maintain that all qualities and attributes without exception, in short the total content of knowledge, is merely a subjective state. This insight leaves it an open question whether the content of knowledge reproduces the actual relations of things. It is possible to doubt whether it does: and this doubt is Sophisticism.

One of the principal Sophists, *Protagoras*, bases his theory upon Heraclitus' doctrine of eternal flux. The universe, he says, consists of nothing but a vast multitude of colliding motions. Every sensation is the result of two such motions; a color-sensation, for instance, arises when a motion approaching the eye from without collides with the motion that constitutes the glance of the eye. And every other state of mind is produced in the same way — pleasure and pain, desire and fear, knowledge and thought. It follows that things exist only as they appear, and that as they appear to every man, so they are. That things exist apart from appearances, is an assertion that cannot be substantiated.

Plato relates in the Phaedo that *Socrates* had accepted as a youth the traditional notion of the soul, but had subsequently lost confidence in it. He would always ask "whether it is the blood by virtue of which we are rational, or air, or fire?" The explanations of the philosophers were so unsatisfactory, that he resolved to abandon psychological and cosmological investigation, believing it a waste of time, and ever after expressing contempt for a knowledge that had no bearing upon action. Socrates agrees with the Sophists in holding that knowledge is a state of the subject, but declines to draw the conclusion that universal and necessary knowledge is therefore impossible. He holds that side by side with our perceptions we have mental states of a different kind which enable us to distinguish between the true and the false — namely, concepts or class-ideas. The business of philosophy is the investigation of these and the determination of their proper content; and we read in Xenophon and Plato how Socrates would discuss the meaning of beautiful and ugly, just and unjust, pious and impious, the essence of prudence and folly, the nature of the family and of the state, etc. He believed that all men, when they think consistently, have identical concepts about such matters, and that therefore, however their perceptions

may differ, they have objective knowledge, at least in moral matters, by virtue of their concepts.

The philosophy of *Plato* is the first great systematic expression of that tendency of thought which places mind before matter as the first principle of things. Such a philosophy involves the consequence that the ultimate ground of all existing things must be sought in the domain of ethics; and so it comes about that the psychological views of Plato are largely influenced by ethical considerations.

The work of previous philosphers has left the postulate that the ultimate ground of existence must be unitary, in contrast to the multiplicity of phenomenal things, and constant, in contrast to their ceaseless flux. The concepts of Socrates seem to Plato to suggest a better hypothesis in regard to the ground of existence than any yet proposed. For the unity of the concept contrasts with the multiplicity of the individual objects to which it applies, and its fixity contrasts with their endless variability. Furthermore, concepts form an articulate system, the lower being included in the higher, and a highest concept including all the others. Now perception merely reveals to us the outward shows of things, while thought acquaints us with their inner reality. If then, every percept corresponds to some external reality, how much more must every concept have a reality corresponding to it? The realities that correspond to concepts are the Platonic Ideas, and the highest Idea, which includes all the others, is the Idea of the Good.

Our two faculties of perception and thought thus reveal to us two disparate worlds: perception reveals a world of individual objects, where all is multiplicity and change; whereas thought opens up to us a realm of supersensible essences, which together constitute a unitary spiritual being, the Idea of the Good. Since the relations of the Ideas correspond exactly to the relations of the concepts by which we know them, we can find out all about reality by turning our attention inward and investigating the mutual relations of our concepts. Here we have the great original of the *a priori* type of philosophy, which disdains experience and undertakes to discover truth by the effort of unaided thought.

It might be expected, since all souls form a class, that Plato would recognize an Idea of the soul. But since the contrast between the Ideas and their individual copies is that between the eternal and the transitory, this would be equivalent to denying the immortality of the soul, which his ethical interest forbids. He therefore assigns to the soul a middle position between Ideas and individual things. He says, moreover, that though there is no Idea of the soul, there is an Idea

with which it is indissolubly connected, namely the Idea of life; which is as much as to say that the soul is the principle of life. Plato believes that the world as a whole is animated by a soul. For the world is a copy of the Idea of the Good, and must therefore be as perfect as possible; now what has reason is more perfect than what has not, but only soul has reason: hence the visible world must have a soul. Hence, in the Timaeus, Plato calls the visible world "a blessed god."

Plato's statements regarding the nature of the soul are made in the first instance with reference to the world-soul. He says that the soul existed first, and the body was formed afterwards, thus recognizing the priority of the soul to the body. The soul is not a mere harmony of the body, as the Pythagoreans maintained; if it were, it would perish with the body. It *has* harmony, but that does not exhaust its being. It is a substance, diffused in harmonious proportions throughout the visible world. The essential qualities of this substance are simplicity, invisibility, and incorporeality. The activity of the soul is twofold, consisting partly in motion and partly in knowledge. The soul is the original source of motion, for it alone is self-moving; all other things receive their motion from without, but the soul moves itself, and in moving itself moves the body. The soul knows all things, for it has the most perfect kind of motion, the circular, by which it "returns into itself and informs itself of everything it has met in its course." All inferior beings have their soul by participation in the world-soul. The highest individual souls are those of the heavenly bodies, next come the souls of men. The end for which the human soul exists is the attainment of rational knowledge, for the soul is by nature "fond of learning." "As the eye is fitted to perceive the sunlight, so is the soul to contemplate the Idea of the Good." Now the contemplation of the Idea of the Good is possible only by rising above sense-experience, and sense-experience has its source in the body. The body is thus little more than a hindrance to the soul; it is a misfortune to the soul to be imprisoned in it; the body is the grave of the soul. The soul did not always dwell in the body, but descended into it from a former celestial state; in its proper nature it has no need of the body; it lives best and happiest when it pays as little attention to the body as possible. For the proper activity of the soul is thought, or the contemplation of ideas, and to this the body can be no help, but only a hindrance.

Since the soul existed before its union with the body in a better state, in which it was entirely occupied in pure thought,

it is evident that the sensible part of the soul does not belong to its real nature. Plato therefore divides the soul into two parts, one immortal, the other mortal; and the latter he subdivides into two, a nobler and an ignobler part. We thus have three parts of the soul:

1. A rational or immortal part, whose activity is thought.
2. A nobler mortal part, to which belong courage, anger, love of power, and in general the better and stronger states states of feeling.
3. An ignobler mortal part, to which belong pleasure and pain, and all the sensual appetites and passions.

In proof that these three are not merely distinct forms of activity, but separate parts, Plato instances the fact that desire is sometimes at strife with reason, and sometimes fights on its side: activities so independent of each other must spring from separate causes. How this trinity of parts is to be reconciled with the unity of the soul, Plato does not explain; they are in reality three connected beings, not one being. Each of the three parts has its special bodily seat. That of thought is the head, and the senses are the instruments it employs; that of courage is the breast, and particularly the heart; that of desire is the belly. The liver is the seat of imagination, by means of which reason rules desire; "upon its polished surface reason causes now terrifying, now diverting images to be reflected, she alters its natural sweetness and color by the introduction of bile, and so either frightens or soothes the appetitive part into obedience." But the soul is also mingled with the spinal marrow. That part of the marrow which is rounded into a ball and enclosed in the skull contains the divine part of the soul; the remainder of the marrow contains the mortal part. Both of these parts are ensheathed in a case of bone, the lower end of which is connected by a tube with the passage for drink, by which liquids pass through the lungs and into the bladder; through this tube the seed makes its escape, for the seed comes from the marrow and therefore contains soul.

The sense-physiology of Plato marks no advance beyond that of Democritus. He observes that as a rule only movable parts have sensation; those that cannot be voluntarily moved, as for example bones and hair, are insensitive. Sensation arises whenever an external impression communicates a motion to the body, and this motion is propagated as far as the soul. As to what conducts these motions, Plato thinks it is the blood in the blood-vessels, owing to its mobility; for both Plato and Aristotle are unacquainted with the nerves. If the motion of the blood takes place very gradually, no sensation is produced; if it takes place quickly, but easily and

without obstruction, we have clear perception, without pleasure or pain ; but if it causes a sensible raising or lowering of the general state, in the one case pleasure arises, in the other pain. Sensations of smell arise when vapors penetrate into the blood-vessels between the head and the navel, and cause there either a rough or a gentle motion. Sensations of taste depend upon the contraction or dilatation of the blood-vessels of the tongue. Auditory sensations arise when external sounds set in motion the air in the interior of the ear. Visual sensations are produced when the fire emitted by the luminous body collides with the fire that dwells in the interior of the eye. Finally, Plato distinguishes from sense-perception the faculty of thought, by means of which we compare our sensations, recognize their relations to one another, and infer from them the existence of actual objects ; but the highest exercise of thought is the contemplation of the divine Ideas.

VI.

Aristotle aims in his Metaphysics to explain the universe by indicating the principles that enter into its construction. He finds that these are four in number: first, the material cause, or stuff of which the universe is composed ; secondly, the formal cause, or idea of which it is a realization ; thirdly, the efficient cause, or motive force which brought it into being ; and fourthly, the final cause, or end which its existence subserves. These four principles — matter, form, motive force, and end — must coöperate to produce the universe as a whole or any portion of it.

If we try to classify these principles with reference to the source from which they come, we have on the one side matter, which must in every case be furnished from without ; and on the other side the ideal form, the efficient act, and the purpose or end, all of which have their origin in the mind. It thus happens that these last three tend to coalesce into a single principle called Form, which stands opposed to matter as that which originates in the mind to that which originates from without. Matter, though the raw material out of which all existing things are formed, is in itself formless and chaotic ; it is likewise wholly passive and unable to move itself. Form, on the other hand, is the principle of activity and the original source of motion. It is that which, by supervening upon unformed matter, transforms it into a concrete object, and may therefore be said to be the ideal of the concrete object it subsequently becomes. In fact, it is Aristotle's substitute for the Platonic Idea, and is even occasionally called by the same name. But there is an important difference between the Platonic

Idea and the Aristotelian Form. Plato represented the Ideas as existing apart from concrete objects in a transcendental realm of their own; Aristotle maintains that they must be immanent in the objects themselves. Only individual things, according to Aristotle, are real in the proper sense of the term; Forms or Ideas, apart from the individual things in which they are realized, are mere figments of the imagination. As in Plato, the ideal or Idea of an individual object is identified with the generic in it, that is, with that assemblage of traits which makes it member of a class. But what is most foreign to our habits of thought is the assumption that the generic in an individual object is not a mere part of its description, but the active force that causes all the changes it undergoes. Change, on this view, consists not so much in Matter taking on new Forms, as in the Forms successsively taking possession of Matter. Matter already contains within itself potentially all the various things it is capable of becoming; when the Forms supervene upon it, this potentiality becomes an actuality. Change may therefore be conceived as the transformation of a potentiality into an actuality.

We are now in a position to understand Aristotle's definition of the soul and his view of the relation between it and the body. Plato may be said to have conceived the union of soul and body as the spatial juxtaposition, as it were, of two independent substances. Aristotle, on the other hand, regards man as an organic whole. He says that the nature of each part must contain the reason for its union with the other. Of this organic whole the soul is the more significant side, yet we cannot say that the soul is the true man and the body a mere appendage. The soul does not think, feel, learn, etc., but the man does so by means of his soul. Old age, illness, drunkenness, etc., are not states of the soul alone, nor of the body alone, but of the unitary being that soul and body constitute. The soul is primarily the cause of life. Now life consists essentially in the power of self-movement, in the capacity of a being to produce changes in itself spontaneously, whether these changes are of a gross character visible to the eye, as in locomotion, or are limited to the minute internal movements that constitute nutrition and growth. We thus have a body in which changes are produced, and an inner principle which produces them, and the relation of the two is exactly that between Matter and Form. Since the body cannot move or change itself, it must be of the nature of Matter; and the soul, as that which moves and produces changes in the body, must be of the nature of Form.

Since all matter is the potentiality of that which it can become, the body must be the potentiality of a living being;

and since the soul is that which transforms this potentiality into an actuality, the soul may be described as the *entelechy* or actuality of a living being. But the word *entelechy* is ambiguous, for it may mean either the actualizing agency, or the activity of actualization. The soul is an *entelechy* in the former sense, for it exists even during sleep, when its functions are suspended; the soul is thus the ever-present possibility of the functions of life. To indicate that the soul is an *entelechy* in the sense of an actualizing agency, Aristotle calls it the *first entelechy*, and his definition therefore reads: the soul is the first *entelechy* of a natural organic body that has in it the potentiality of life. Since the soul is the form of the body, it must be immaterial; but, though immaterial, it cannot exist apart from matter. Indeed, Aristotle mentions a special kind of matter with which the soul is directly connected, and with which it passes in generation from one being to another. This he sometimes designates as warmth, sometimes as the breath; he describes it as of nobler nature than the four elements, and as resembling ether. The solution, then, of the problem, how soul and body can constitute a single being, is that the two belong to totally different orders of existence. Like form and matter everywhere, they are distinguishable in thought, but they cannot exist separately, any more than the eye and vision can exist separately.

Plato not only distinguished three parts of the soul, but assigned to them separate seats in the body. Aristotle raises the question whether such spatial separation can consist with the unity of the soul, and decides that it cannot. He therefore contents himself with enumerating the classes into which psychical manifestations fall, and distinguishes four:

1. Nutrition and growth — the nutritive part.
2. Sensation and perception — the sensitive part.
3. Desire and locomotion — the locomotive part.
4. Thought — the rational part.

Of these four, plants possess only the nutritive soul; animals have this and the sensitive soul as well. The lowest kind of sensation is touch, and this all animals possess; with touch go always pleasure and pain. Most animals have locomotion as well as sensation, and with this desire. Man, finally, possesses in addition to the nutritive, the sensitive, and the locomotive soul the highest form of psychical activity, rational thought. It thus appears that the lower parts can occur without the higher, but not the higher without the lower. Notwithstanding these various forms of psychical activity, it is the same identical soul which manifests itself in them all. If the soul consisted of several juxtaposed pieces, it would be

held together by the body; whereas in reality the body is held together by the soul.

The central organ of psychical activity is the heart, not the brain, whose function is merely that of cooling the blood. The heart is the organ both of sensation and of locomotion. Tactual sensations are propagated to the heart through the flesh, all others through certain "channels," by which Aristotle undoubtedly means the blood-vessels, for he knows nothing of the nerves. The heart also causes the movements of the limbs.

Sensation is the most distinctive characteristic of the animal as compared with the plant. It consists in "an alteration brought about by the perceived object in the percipient subject through the medium of the body." This alteration is of such a sort that the percipient subject, functioning as matter, takes upon itself the form of the perceived object. Sense-perception may therefore be defined as the reception of the form of an object without its matter. The action of objects upon the senses always takes place through some medium; in the case of vision this medium is light, in that of hearing air, in that of smell moisture. In touch and taste there seems to be no medium, but there is one, namely the flesh, and the true organ of these senses is therefore not the skin, but the heart. The fact that by touch we perceive so many pairs of opposites — hard soft, rough smooth, dry wet, warm cold — suggests to Aristotle the doubt whether it is really a single sense; which he silences with the remark that the other senses also perceive more than one pair — hearing, for example, perceives not only differences of pitch (high low), but also differences of intensity (loud soft), roughness and smoothness of voice, etc. The senses of touch and taste are so indispensable to existence that all animals possess them. They are the lowest senses, for they minister to the lowest functions, those of nutrition and reproduction. Sight and hearing, on the other hand, stand highest, for they are the means by which the intellect is developed; and of the two, hearing is the superior sense, because upon it the communication of ideas by means of language depends. Aristotle endeavors to prove, as against Democritus, that it is impossible there should be other senses than the five.

Each of the senses yields us a kind of sensation peculiar to itself alone; for instance, vision alone yields color, smell alone odor, etc. But there are other qualities of objects which are common to the perceptions of all the senses, namely such universal qualities as number, size, and form, motion and rest, and time. Now we cannot suppose, to take an example, that the

space we see is a different space from that we touch; but if they are one and the same space, they must be perceived by one and the same faculty; and therefore not by sight nor by touch, but by some deeper-lying faculty which functions in connection with both these senses. This faculty Aristotle calls the *sensus communis*. It is this faculty by which we compare and distinguish the data of the different senses, for no single sense can compare what it perceives with what is perceived by some other sense. It is this faculty which considers our sensations as representing something objective, for the individual senses cannot judge of this, but can only feel what they feel. It is this faculty, finally, upon which self-consciousness depends, for "sight perceives only what is colored, and if sight perceived seeing, seeing would itself have to be colored."

The *sensus communis* is also the faculty of imagination and of memory. Imagination is an after-effect of sensation, a weakened form of sensation. For the commotion produced by the original impression persists in the sense-organ, and when it is again propagated to the heart, it causes a revival of the original sensation in the absence of the object that caused it. When this image is not only revived, but regarded as the copy of the previous sensation, we have memory; and the voluntary reproduction of a memory is recollection. Recollection is rendered possible by the fact that the organic motions which accompany the images of memory have a mutual connection, of such a sort that one calls up another; and the reason for this connection may lie in their similarity, their contrast, or their previous conjunction in time. Imagination, finally, furnishes the visions we see in our dreams, as well as the images that accompany thought.

Thought, or reason, is the highest of the mental faculties, and is that which distinguishes man from the lower animals. Though distinct from sense-perception, it deals with the same objects, that is, with the images which sense-perception furnishes. But it is concerned with a different aspect of them from that which occupies sense-perception, namely the generic in them. It is also concerned with relations such as likeness and unlikeness, cause and effect, form and matter, etc. Aristotle distinguishes two kinds of reason, the active and the passive, corresponding to the distinction that everywhere obtains between form and matter, and teaches that the cooperation of these two is necessary to actual thought. Thought as matter he calls the passive reason; thought as form his later followers call the active reason. To understand this somewhat difficult distinction, we must recur to Aristotle's explanation of sense-perception. As in sense-perception the human

faculty, functioning as matter, takes on the form of the external object, so in rational thought the human faculty, or passive reason, as matter, unites with the conceptual relations that are immanent in our percepts, as form, and it is these conceptual relations which Aristotle designates as the active reason. When the two unite, actual thought is the result. The strangeness of this distinction lies in the fact that Aristotle attributes the activity that manifests itself in thought to the content thought about. From this point of view it would seem less correct to say that we think thoughts than that thoughts think us. Aristotle says that the passive reason comes into existence with the body and perishes with it, and during life participates in its states. But the active reason has nothing to do with the life of the body; has no bodily organ; does not come into existence by procreation, but enters the body from without; and is therefore unaffected by the destruction of the body. The immortality of this part can have, however, little worth for the individual, for it possesses neither memory nor self-consciousness.

Though Aristotle's statements regarding the active reason may seem to mark a relapse into dualism, yet his psychology as a whole is distinctly monistic. He conceives the development of the soul as running parallel to that of the body, and his method is a biological-developmental one. He is a keen observer of mental phenomena as well as a profound metaphysician; he brings to bear upon psychology as much of anatomy and physiology as was known in his time; and he everywhere brings human into fruitful relations with animal psychology. Finally, he delivers psychology from the premature influence of ethics, recognizing that ethics depends upon psychology, not psychology upon ethics. It is these merits which make Aristotle the greatest psychologist of antiquity.